

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1-2, and 4-14 are currently pending in this application. No claims have been amended. Accordingly, no new matter has been added.

In view of the remarks herein, Applicants respectfully request that the Examiner withdraw all outstanding rejections and allow the currently pending claims.

Specification

The Examiner asserts that the title of the invention is not descriptive, and requires a new title that is "clearly indicative" of the invention to which the claims are directed.

Applicants have amended the title so as to address the issues identified by the Examiner. Accordingly, this objection is moot.

Double Patenting

Claims 6, 9 and 10 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. 6,802,993 to Momoda et al. (hereinafter Momoda '993). Applicants respectfully traverse.

The Examiner notes that the presently pending claims are directed to a curable composition comprising (I) a monomer represented by formula (1), (II) a monomer represented by formula (2), (III) a polymerizable monomer other than (1) or (2), (IV) a photochromic compound, and (V) polymerization initiators. The Examiner asserts that "specific embodiments of these formulae result in compositions that overlap U.S. 6,802,993".

Applicants respectfully submit that present claims 6, 9 and 10 are patentably distinct from claims 1 and 2 of Momoda '993. The polymerization curable compositions of claims 6, 9 and 10 of the present application comprise (I) a polyfunctional polymerizable monomer, (II) a bifunctional polymerizable monomer, (III) another polymerizable monomer, (IV) a photochromic compound, and (V) a polymerization initiator. In contrast, claims 1 and 2 of Momoda '993 do not include a polymerization initiator, and do not include a limitation that the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of this compound in the polymerization curable composition.

The composition of claim 6 comprises a thermopolymerization initiator as the polymerization initiator (V), 1 to 15 wt% of component (I), 10 to 80 wt% of component (II) and 5 to 89 wt% of component (III). The composition of claim 9 comprises a photopolymerization initiator as the polymerization initiator (V), 1 to 60 wt% of component (I), 10 to 90 wt% of component (II) and 0 to 89 wt% of component III. Due to the specific components present in the polymerizable curable compositions of claims 6 and 9, as well as the specific ratios of these components, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the photochromic compound (IV) in the polymerization curable composition, and the cured product (substrate) of the polymerization curable composition has a tensile strength of 20 kgf or more.

As the ratio of the polyfunctional component (I) to the curable composition comprising the above components (I), (II) and (III) increases, the tensile strength of the obtained cured product decreases, but the photochromic property of the product improves. The present

inventors have discovered a curable composition which exhibits a good balance between tensile strength (20 kfg or more) and photochromic property, and produces a superior material for a photochromic lens substrate, said composition comprising the above described specific components (including either a thermo or photo-initiator). Prior to the present invention, the use of components (I), (II) and (III) in the above specific ratios in order to achieve a high tensile strength and superior photochromic properties, suitable for a photochromic lens substrate, had been unknown.

Momoda '993 discloses a curable composition comprising a radically polymerizable monomer having an alkoxysilyl group as an essential component and a photochromic cured product which is a cured product of the composition. Thermosetting compositions comprising trimethylolpropane trimethacrylate (TMPT), which is a polyfunctional radically polymerizable monomer, 2,2-bis(4-methacryloyloxyethoxyphenyl)propane (BPE), which is a bifunctional polymerizable monomer, and t-butyl peroxyneodecanoate (ND), which is a radical polymerization initiator (thermopolymerization initiator) are disclosed in Examples 1 to 7 and 10 to 20. Out of these, only the composition of Example 10 comprises 5 wt% of TMPT, 25 wt% of BPE and 70 wt% of the other polymerizable monomer.

However, as evidenced by the enclosed Declaration Under 37 CFR 1.132, the tensile strength of a cured product having the above-described thermosetting composition is 18.5 kgf, which is lower than the tensile strength (20 kgf) of the cured product of the present invention. The reason for this seems to be that the radically polymerizable monomer having an alkoxysilyl group as an essential component slightly reduces the tensile strength of a cured product though it has a large effect of improving adhesion to a hard coat.

Thus, Applicants respectfully submit that present claims 6, 9 and 10 are patentably distinct from claims 1 and 2 of Momoda '993. Reconsideration and withdrawal of this rejection are respectfully requested.

Issues Under 35 U.S.C. § 102

EP 1130038

Claims 5-7, 9 and 10 stand rejected under 35 U.S.C. §102(b) as anticipated by EP 1,130,038 (hereinafter EP '038). Applicants respectfully traverse.

The Examiner asserts that EP '038 discloses a curable composition comprising (A) a polymerizable monomer, (B) a polyfunctional monomer, (C) a difunctional polymerizable monomer and (D) a photochromic compound.

Initially, Applicants note that claim 5 depends on independent claim 4, which does not stand rejected as anticipated by EP '038. Accordingly, the rejection of claim 5 is improper and should be withdrawn.

Furthermore, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of anticipation. For anticipation under 35 U.S.C. §102, the reference must teach each and every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is

necessarily present". *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *Id.*

As previously discussed, the present invention is directed, *inter alia*, to polymerizable curable compositions comprising (I) a polyfunctional polymerizable monomer, (II) a bifunctional polymerizable monomer, (III) another polymerizable monomer, (IV) a photochromic compound, and (V) a polymerization initiator. Due to the specific components present in the claimed polymerizable curable compositions, as well as the specific ratios of these components, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the photochromic compound (IV) in the polymerization curable composition, and the cured product (substrate) of the polymerization curable composition has a tensile strength of 20 kgf or more.

Initially, Applicants note that the Examiner has not addressed the present limitation that "the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the photochromic compound (IV) in the polymerization curable composition, and the substrate has a tensile strength of 20Kgf or more". Furthermore, Applicants submit that EP '038 fails to explicitly or implicitly teach the presently claimed curable composition having the specific composition described in, for example, claims 6 and 9.

For instance, each and every one of the Examples of EP '038 (see Examples 1-58) utilizes a thermoinitiator (t-butylperoxyneodecanoate). In Examples 1, 5, 23, 27, 57 and 58, a polyfunctional monomer (TMPT: trimethylolpropane trimethacrylate) is used in a ratio (1 to 15 wt%) similar to that of claims 6 and 9 of the present application. However, the compound

represented by the formula (II) specified in claims 6 and 9 of the present application (for example, BPE: 2,2-bis(4-methacryloyloxyethoxyphenyl)propane) is not taught by EP '038 or used as a bifunctional monomer.

Therefore, as EP '038 fails to disclose the presently claimed curable composition having the composition, tensile strength and photochromic properties specified in claim 1 of the present application, claims 6, 7, 9 and 10 of the present application cannot possibly be anticipated by EP '038.

Reconsideration and withdrawal of this rejection are thus respectfully requested.

Momoda '993

Claims 6, 9 and 10 stand rejected under 35 U.S.C. §102(e) as anticipated by Momoda '993. Applicants respectfully traverse.

Initially, Applicants note that the International Application (IA) of Momoda '993 was published on April 11, 2002 in Japanese. Under U.S. patent laws, references based on the national stage of an International Application filed on or after November 20, 2000 and which was not published in English under PCT Article 21(2) have no 35 U.S.C. 102(e) prior art date at all (see MPEP 706.02(f)(1)). Accordingly, the outstanding rejection of claims 6, 9 and 10 under 35 U.S.C. 102(e) is improper.

Furthermore, Applicants submit that the Examiner has failed to establish a *prima facie* case of anticipation. As previously discussed, the present invention is directed, *inter alia*, to polymerizable curable compositions comprising (I) a polyfunctional polymerizable monomer, (II) a bifunctional polymerizable monomer, (III) another polymerizable monomer, (IV) a

photochromic compound, and (V) a polymerization initiator. Furthermore, as discussed above, due to the specific components present in the claimed polymerizable curable compositions, as well as the specific ratios of these components, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the photochromic compound (IV) in the polymerization curable composition, and the cured product (substrate) of the polymerization curable composition has a tensile strength of 20 kgf or more.

As discussed above, Momoda '993 discloses a curable composition comprising a radically polymerizable monomer having an alkoxysilyl group as an essential component and a photochromic cured product which is a cured product of the composition. However, as evidenced by the enclosed Declaration, the tensile strength of a cured product of the thermosetting composition of Momoda '993 is lower than the tensile strength of the cured product of the present invention.

Clearly, Momoda '993 fails to explicitly or implicitly teach a curable composition having the specific composition and properties (tensile strength and photochromic property) of the presently claimed composition.

Because Momoda '993 fails to teach each and every limitation of the present invention, as required by 35 U.S.C. 102, this rejection is improper and should be withdrawn.

Reconsideration and withdrawal of this rejection are respectfully requested.

Issues Under 35 U.S.C. § 103(a)

Claims 1 and 4 stand rejected under 35 U.S.C. §103(a) as being obvious over EP '038. Claims 2, 8 and 11-14 stand rejected under 35 U.S.C. §103(a) as being obvious over EP '038 in view of secondary references (Imura '931 and Geffcken '869). Applicants respectfully traverse.

The Examiner notes that it would be obvious to one skilled in the art to modify the tensile strength of the cured composition, as well as the half-life period of the photochromic compounds (IV). The Examiner further notes that "the composition disclosed by Momoda et al. could be the same composition as disclosed by Applicants".

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Additionally, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the "teaching, suggestion, motivation test" is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.*

As discussed above, EP '038 fails to teach or suggest the presently claimed curable compositions (see, for example, claims 6 and 9). Thus, it follows that EP '038 does not teach or suggest the photochromic lens substrate of claims 1 and 4, which comprise the claimed curable compositions of claims 6 and 9. Imura '931 and Geffcken '869 fail to cure the deficiencies of EP '038.

Imura '931 is directed to a polymerizable composition comprising at least two di(meth)acrylate compounds of the specific general formula (I), the polymerizable composition being suitable as a transparent resin. Imura '931, however, does not teach or suggest the presently claimed polymerizable curable composition or photochromic lens substrate.

Geffcken '869 discloses a method of applying hard inorganic layers to plastics. Geffcken '869 does not teach or suggest a polymerizable curable composition or photochromic lens substrate as presently claimed.

Evidently, the cited references, alone or in combination, fail to teach or suggest every limitation of the instant invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Conclusion

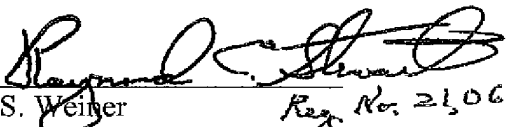
All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Marc S. Weiner, Reg. No. 32,181 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 
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Enclosure: Declaration Under 37 C.F.R. 1.132

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF :
JUNJI TAKENAKA, ET AL. :EXAMINER: John Freeman
SERIAL NO.: 10/549,696 :
FILED: SEPTEMBER 19, 2005 :GROUP ART UNIT: 1709
FOR: POLYMERIZATION CURABLE :
COMPOSITION

DECLARATION UNDER 37 C.F.R. 1,132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

I, Junji Takenaka, am one of the inventors of the present application and have measured the tensile strength of a lens obtained by reworking Example 10 of US 6802993B2.

Experiment

1 part by weight of perbutyl ND as a polymerization initiator was added to 100 parts by weight of polymerizable monomers consisting of 5 parts by weight of trimethylolpropane trimethacrylate, 5 parts by weight of γ -methacryloyloxypropyl trimethoxysilane, 25 parts by weight of 2,2-bis(4-methacryloyloxyethoxyphenyl)propane, 38 parts by weight of tetraethylene glycol dimethacrylate, 10 parts by weight of methyl ether polyethylene glycol methacrylate having an average molecular weight of 1,000, 10 parts by weight of glycidyl methacrylate, 6 parts by weight of α -methylstyrene and 1 part by weight of α -methyl styrene dimer and mixed with them thoroughly. This mixed solution was poured into a mold composed of glass plates and a gasket made of an ethylene-vinyl acetate copolymer to carry out cast polymerization. The polymerization was carried out by using an air furnace and gradually increasing the temperature from 30 to 90°C over 18 hours and maintaining the temperature at 90°C for 2 hours. After the end of polymerization, the cured product was taken

out from the glass mold.

Measurement of tensile strength

The cured products obtained in Experiment was formed into disk-like test samples having a thickness of 2 mm and a diameter of 5 cm, two holes having a diameter of 2 mm were drilled on a line which is the diameter of each test sample with points 4 mm away from the periphery as the centers, two stainless steel rods having a diameter of 1.6 mm were inserted into the two holes and fixed to upper and lower chucks of a tensile tester while they extended through the holes, and the tensile strength of the test sample was measured by pulling at a rate of 5 mm/min. This measurement was made on 7 samples and the average value of the measurement data excluding those of two samples showing the largest and smallest measurement values was obtained.

Results

The obtained tensile strength value was 18.5 kgf in Experiment.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Further declarant saith not.

Junji Takenaka
Signature

Dec. 5th . 2007
Date